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Seventh

NSRIF  
E83-10082

CR-169594

## QUARTERLY REPORT

period ending September 30, 1982

for

NASA contract NAS 5-26425 ✓

"Use of MAGSAT anomaly data for crustal structure  
and mineral resources in the U.S. Midcontinent"

from

Robert S. Carmichael et al  
Department of Geology  
UNIVERSITY OF IOWA  
Iowa City, Iowa 52242

Project Scientist: Dr. R. A. Langel  
NASA Goddard Space Flight Center

Technical Officer: Mr. H. Oseroff

(E83-10082) USE OF MAGSAT ANOMALY DATA FOR  
CRUSTAL STRUCTURE AND MINERAL RESOURCES IN  
THE US MIDCONTINENT Quarterly Report,  
period ending 30 Sep. 1982 (Iowa Univ.) 5 p  
HC A02/MF A01

N83-14590

Unclas  
CSCL 08G G3/43 00082

September 30, 1982

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OCT 12, 1982

SIS/9026

Type II

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### Quarterly Report

Work is proceeding with correlation of MAGSAT anomaly maps with geological and geophysical data sets. For example, an excerpt from the recent Bouguer gravity map of the U.S. (Hildenbrand et al, U.S.G.S., 1982) is Figure 1 attached here. It has been filtered to retain wavelengths of 250 km, thus being physically somewhat analogous to MAGSAT data at 400 km height, and we are now extracting residual anomalies to compare with the satellite magnetics (e.g. Figure 2 here).

We are awaiting the SEG's U.S. Magnetic Anomaly Map, due for pre-publication release in a week or two from now.

One graduate student is completing a thesis project using 3-dimensional magnetic modelling, and two others are beginning related geophysical studies.

Attached is a program excerpt from the upcoming SEG Annual Meeting (Dallas, October) with the session on MAGSAT results.

#### Funds expended (July-Sept. 1982)

Previously spent and committed (Dec. 1980-June 1982) \$ 29,191.31

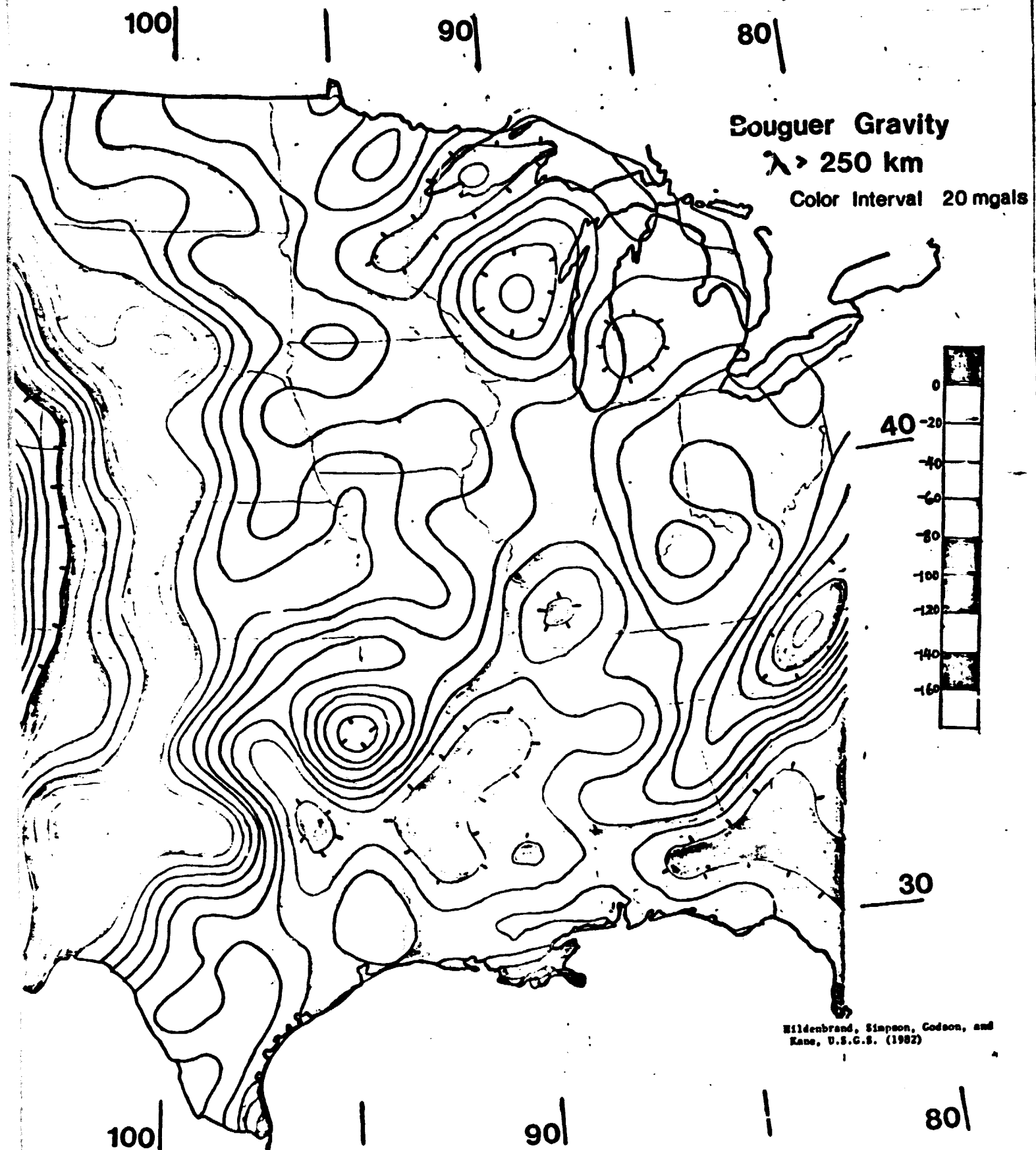
#### Committed in this Quarter:

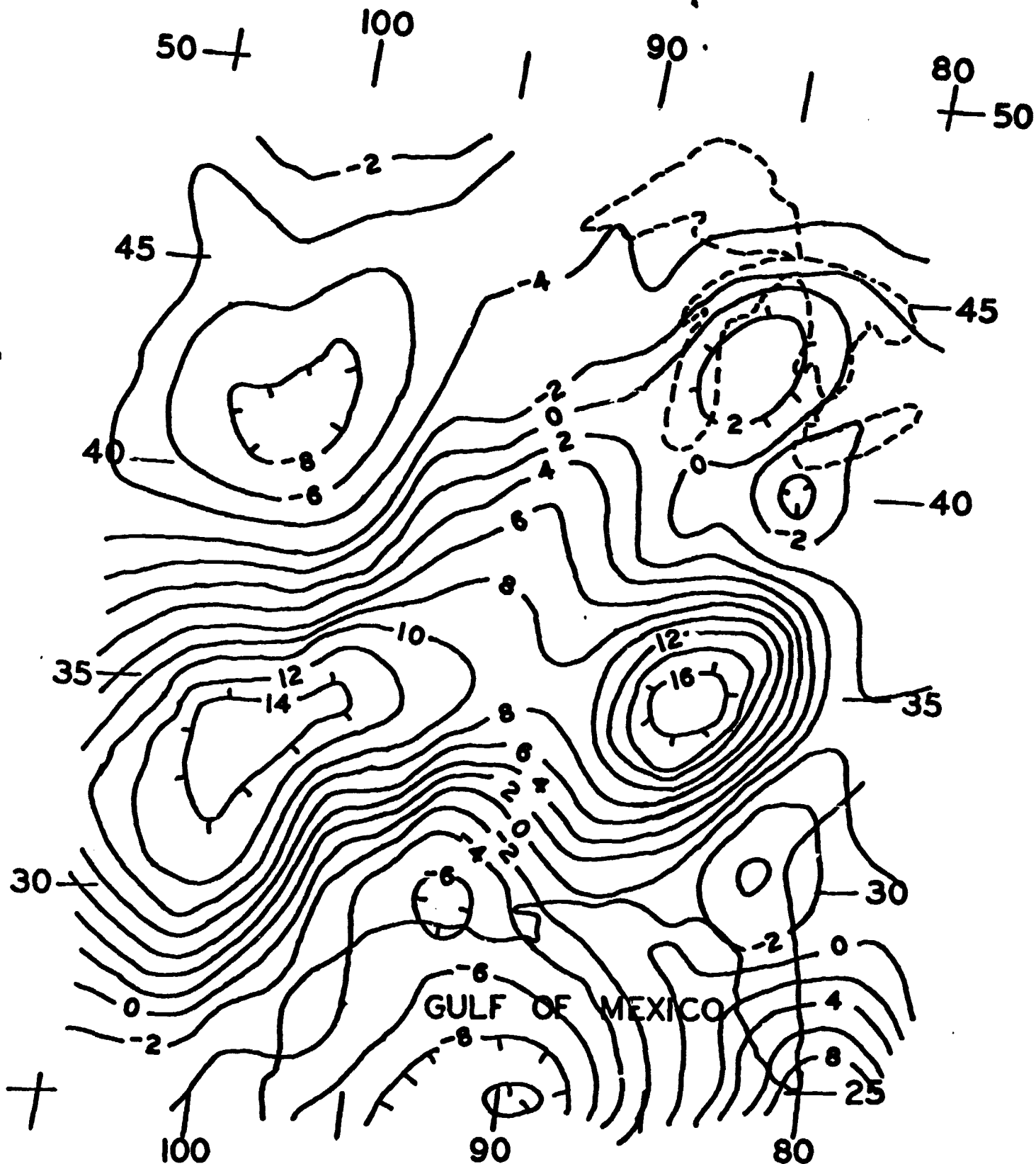
Supplies, materials, xeroxing, postage, computer	341.38
Wages: Research Assistantship, grad. student 1	850.
Research Assistantship, grad. student 2	850.
Investigator salaries (summer)	3,933.
Overhead and Staff benefits (to University, for June-August)	<u>3,151.39</u>
	9,125.77

Total to date ..... \$ 38,317.08

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Figure 1. (reproduction quality  
not good; original is larger  
and in color)





**Figure 2.**

1°x1° scalar data at 400 km altitude, high-pass filtered and reduced to the magnetic pole. Contour interval of 2 gammas. Zero-level is arbitrary. Processed from NASA Magsat satellite data.

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## Monday Morning, October 18

### Papers from the AAPG Meeting

#### Session Chairmen

Kevin M. Barry, Teledyne Exploration  
J. Phillip Shannon, Margaret Welch,  
Exxon Production Research Co.  
Late Mesozoic Carbonate Banks and Reefs  
along U.S. Atlantic Margin — J. A. Grow,  
W. P. Dillon, and J. S. Schlee, U.S.G.S.

Countess Oil Field, South  
Canada's A Case History  
Graphic Trap — A. W. M.  
Alex W. McCoy Associa  
How to Improve Your E  
Ration A Case Study —  
Oil Exploration & Produ  
The Thinking Man's Get  
John M. Parker, Consult  
Petroleum Geology of t  
Northwest Territories, C  
D. R. Horn, and D. S. Ti  
Canada

The Gulf of Alaska A C  
Amoco Production Co.  
An Effective Exploratio  
and Paleogeographic Cor  
Migration in the Denver  
Amoco Production Co.  
Geology of Norton Bas  
— M. A. Fisher, U.S.G.S.

Seismic I — Data P  
Session Chairmen  
J. Swan Blankenship,  
Don A. Bennett, Texi  
Transition Zone Proces  
R. C. Farrell, Seiscom I

Binning and Time — V.  
Seismic Data — P. S. S  
Digicon Inc.  
Application of the Tau  
Stacks in Processing S  
R. H. Tatham, J. Keene  
D. Goolsbee, J. Wiley.

Residual Migration — F. Rocca, Politecnico  
and L. Salvadori, AGIP, Italy  
High-Speed Interactive System for Interpretive  
Migration — A. J. Berkhout, J. Riddler, Delft  
Univ. of Tech., Netherlands; and D. Larson,  
GeoQuest International

Pre-stack Wavelet Deconvolution — M. Potts,  
K. Schleicher, C. Wason, and S. Ellender, GSI  
Long Period Multiple Reflection Suppression

"The Dallas Geophysical Society is honored  
to be the host for the Fifty-Second Annual  
International Meeting and Exposition of  
the Society of Exploration Geophysicists to  
be held in Dallas, Texas, October 17-21,  
1982. On behalf of the Society, the Dallas  
Section and the Annual Meeting Commit-  
tee, I invite you to attend this important  
meeting at the Dallas Convention Center in  
the heart of our thriving downtown."

An outstanding program has been developed by  
Technical Program Chairman, Edwin B. Nitzel and  
his 12-member committee to highlight the theme of  
this year's convention: "Geophysics — New Dimen-  
sions for the 80's".

The official kick-off of the Annual Meeting occurs  
Monday afternoon (October 18) at an all new "Presi-  
dential Session" in the Dallas Convention Center  
Theatre.  
In addition to nearly 300 technical papers, an  
unprecedented three Continuing Education courses  
before the meeting and four post-convention  
workshops offer you a tremendous opportunity for  
"technical rejuvenation".

Logs — K. M. Tubman\*, C. H. Cheng, and  
M. N. Toksoz, M.I.T.  
Complex Phase Velocity and Mode Shape of  
Borehole Acoustic Waves — O. Y. Liu,  
Schlumberger Well Services  
Sonic Propagation in a Field Filled Slow Forma-  
tion Borehole — S. K. Chang, T. O. Marzetta,  
and M. Schoenberg, Schlumberger-Doll Research  
Approximate Effects of Off-Center Acoustic  
Sensors and Elliptic Boreholes upon Full

and Enhanced Velocity Discrimination Using a  
Weighted Stack — R. C. Pruett, Arco Oil and Gas  
Amplitude Preservation for Sign-Bit Vibroseis  
Data: A Synthetic Study — S. Y. C. Lee,  
F. Ngien, and W. A. Schneider\*, Colorado  
School of Mines

### Research Symposium on Geopressure Studies

#### Session Chairmen

Nader C. Dutta, Shell Development Co.  
Neal R. Goins, Mobil R & D Corp.

Three-Dimensional Gravity Data — H. J. Coetz\*,  
F. Keller, B. Lahmeyer, and O. Rosenbach,  
Tech. Univ. of Clausthal, West Germany  
Interactive Processing of Potential Fields as a  
Geologic Interpretation Tool: Application to  
the Discovery of New Primary Prospects for  
Raw Materials — D. Chenot, CIP, N. Debaglie  
and A. Guillen\*, Bureau de Recherches  
Geologiques et Minieres, France  
Techniques for Modeling Complex, Deep  
Sources of Observed Magnetic Anomalies with  
Constraints — D. J. Teskey, Energy, Mines and  
Resources, Canada  
Direct Multilayer Interpretation of Gravity Pro-  
files Using Point by Point Method — S. Jain,  
Commonwealth Geophysical Development Co.,  
Canada

Simultaneous Inversion of Gravity and  
Magnetic Anomalies — M. R. Hong\*, Univ. of  
Texas, Dallas; W. J. Peeples, Univ. of Texas, El  
Paso; and C. L. V. Aiken, Univ. of Texas, Dallas  
Generalized Linear Inversion of 2-Dimensional  
Gravity and Magnetic Anomalies — S. F. Lal\*,  
Univ. of Texas, Dallas; W. J. Peeples, Univ. of  
Texas, El Paso; and C. L. V. Aiken, Univ. of  
Texas, Dallas  
Continuation of Potential Fields between  
Arbitrary Surfaces Using Equivalent Source  
Distributions — R. O. Hansen, E&G Geometrics  
Reduction-to-the-Pole of Low Latitude  
Magnetic Anomalies — W. C. Pearson\* and  
C. M. Skinner, Three-D Gravity Inc.

Magnet Anomaly Crustal Studies  
Session Chairmen  
Mark Settle, NASA  
Robert D. Rogan, Arco Service Co.  
Results of the Magnet Mission — M. Settle\*,  
NASA; and R. Langel, Goddard Space Flight Center  
Data Selection Techniques in the Interpretation  
of Magnet Data over Australia — B. D. Johnson\*,  
and C. N. G. Dampney, Macquarie Univ., Australia  
Large-Scale Crustal Magnetization Models  
Derived from Satellite Magnetic Anomaly Data  
— M. A. Mayhew, BTS Inc.  
Crustal Interpretation of the Magnet Data over  
the U.S. — K. H. Son\* and I. J. Won, North  
Carolina State Univ.  
Use of Magnet Satellite Magnetic Anomaly  
Data to Interpret Crustal Character and

Waveform Logs — M. E. Willis\*, M. N. Toksoz,  
and C. H. Cheng, M.I.T.  
State of the Art on EVA Data Processings An  
Improvement of Subsurface Imaging —  
P. C. Arditty\*, G. Arens, and Ph. Sieron, Elf  
Aquitaine, France  
Sonic Log Error Recognition and Correction by  
Wiener Interpolation — J. P. Castagna\* and  
C. J. Sicking, Arco Oil and Gas

### Potential Fields I — Computation Techniques

#### Session Chairmen

Peter J. Hood, Energy, Mines and Resources,  
Canada  
D. M. Schelbe, Defense Mapping Agency  
Interactive Modeling and Interpretation of  
Three-Dimensional Gravity Data — H. J. Coetz\*,  
F. Keller, B. Lahmeyer, and O. Rosenbach,  
Tech. Univ. of Clausthal, West Germany  
Interactive Processing of Potential Fields as a  
Geologic Interpretation Tool: Application to  
the Discovery of New Primary Prospects for  
Raw Materials — D. Chenot, CIP, N. Debaglie  
and A. Guillen\*, Bureau de Recherches  
Geologiques et Minieres, France  
Techniques for Modeling Complex, Deep  
Sources of Observed Magnetic Anomalies with  
Constraints — D. J. Teskey, Energy, Mines and  
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Data to Interpret Crustal Character and

Resource Potential of the U.S. Midcontinent  
R. S. Carmichael\* and R. Black, Univ. of Iowa  
Satellite Magnetic Anomalies of Africa and  
Europe — R. Olivier\*, Univ. of Lausanne,  
Switzerland; W. J. Hinze\* and R. B. von Frey  
Purdue Univ.  
Satellite Magnetometry over Antarctica —  
M. H. Ritzler\* and C. R. Bentley, Geophysics  
and Polar Research Center, Univ. of Wisconsin  
Madison  
Estimating Lower Crust Magnetization from  
Magnet Data — C. C. Schnetzler, NASA

### MOVING ENERGY FOR THE FUTURE

#### Session Chairmen

Carolyn Dalgre, Bell & Murphy  
Energy for the Future  
Energy: A Matter of Choices  
Adventures: Oil and Gas Offshore  
The Energy Seekers  
Energy for the '80s  
A Play Half Written:  
The Energy Adventure  
The Road to Energy, U.S.A.

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### Geothermal Luncheon

Monday, October 18, 12:00 Noon  
Geophysical Convention Center  
George V. Keller, Colorado School of Mines

### Monday Afternoon, October

#### Presidential Session

Session Chairmen  
Edwin B. Nitzel, ARCO Oil and Gas Co.  
R. B. Rice\*, Consultant  
David J. Saliba, Mobil Oil Corp.  
1982 Keynote Address: Geophysics — New  
Dimensions for the 80's — Douglas D. Barm  
President, Society of Exploration Geophysical  
1982 Distinguished Lecture: Deconvolution  
Like But Don't Abuse — Sven Treitel, Amoco  
Research Center  
Award Presentations: "Best Paper in  
Geophysics", "Best Presentation Awards"

#### Governmental Affairs Session

Session Chairmen and Moderators  
Carl Savitt, Western Geophysical Co.  
Hugh W. Hardy, GeoQuest International  
"Energy and Governments" — World Outlook  
and Various Viewpoints — This special session  
will include comments and a panel discussion  
by representatives from the U.S. Administration  
and representatives from other oil producing  
nations. Robert E. Wycoff, Executive Vice  
President of Atlantic Richfield Company, will  
speak on "Energy from the Majors' Point of  
View", and David K. Davis, Senior Vice Presi-  
dent, Texas Independent Producers and  
Royalty Owners Association, will speak on  
"Energy from the Independents' Point of View"